

Identification Notes

ID Notes for Wildlife Inspectors

CATEGORY: MAMMALS

Scientific Name/s: *Pantholops hodgsonii*

Common Name/s: Tibetan Antelope

Microscopic Distinctions in the Kemp Fibers of the Tibetan Antelope (*Pantholops hodgsonii*)

by Bonnie C. Yates

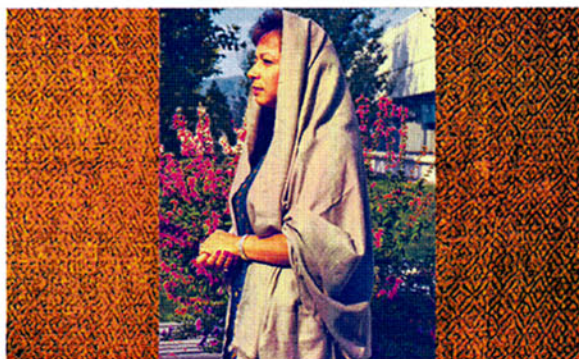
U.S. Fish & Wildlife Service

National Fish & Wildlife Forensics Laboratory

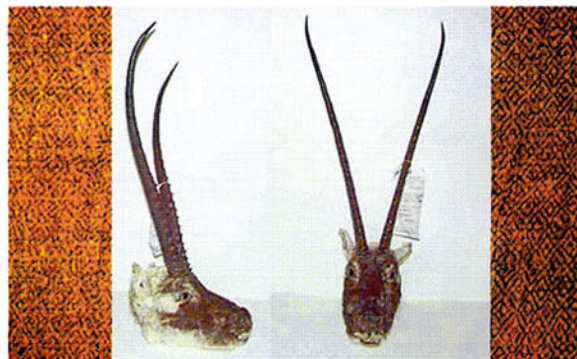
Abstract

The Tibetan antelope, or chiru (*Pantholops hodgsonii*), is considered an endangered species and is listed on Appendix I of the CITES agreement. Its underwool is highly valued as the finest fleece of any mammal. Recent seizures worldwide of processed fibers and finished manufactured goods made from this fleece, called shahtoosh, have raised concern over the survival of this species. Because the antelope is already rare, the scarcity of shahtoosh has caused manufacturers and exporters to designate a subspecies of *Capra ibex* as the "shahtoosh goat" and market the fiber at high prices to emulate the tradition of the authentic fleece of *Pantholops*. The manufacture of woollen blends complicates the mandate of the USFWS to interdict shipments of products made from endangered species. Therefore, microscopic analysis is necessary to differentiate wool of *Pantholops* from all other species. Optical microscopy reveals distinctive characteristics in the medulla of the kemp fibers (guard hairs), which are usually incorporated into any woven shahtoosh product, and thus can be used to detect the illegal importation of products made from the endangered Tibetan antelope.

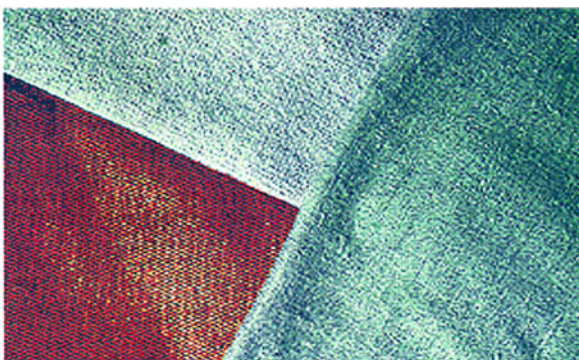
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The US Fish & Wildlife Service has prohibited the importation of any part or product made from *Pantholops hodgsonii* in recognition of its Appendix I status in the Cites agreement (July 1, 1975). The most common products are shawls.



Shahtoosh is the name of a fabric woven from the fleece of the "chiru" or Tibetan antelope (*Pantholops hodgsonii*), a rare and endangered goat-sized antelope that lives in the high Himalayas. For centuries, shahtoosh was reserved for exclusive use of the royal classes.



Recent importations of woven shawls for retail sale in the US have been interdicted for determination of the presence of fibers originating from this species. Use of the term "shahtoosh" has been extended in commercial circles to include fabrics manufactured as blends of cashmere, sheep's wool, and shahtoosh, although the latter commands the highest prices.



Manufacturers have even gone so far as to rename a wild species of ibex as the "shahtoosh goat" in order to maintain the exclusivity and high price connected to the fabric. By using a picture of an ibex in a promotional brochure, it appears that an attempt is being made to circumvent suspicion away from its original species source.

Submitted by: Bonnie C. Yates, National Fish and Wildlife Laboratory, Ashland, OR USA

Date submitted: . / . / .

Prepared in cooperation with the National Fish & Wildlife Forensics Laboratory, Ashland, OR, USA

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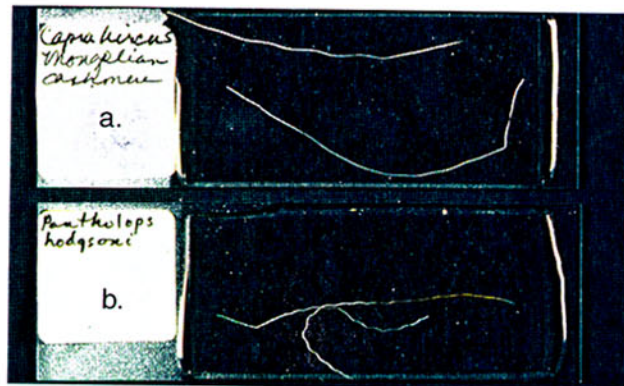
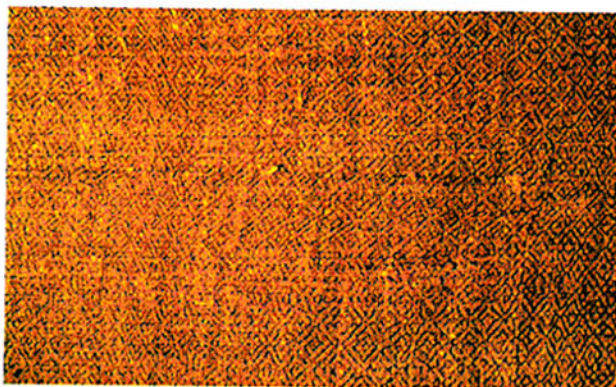
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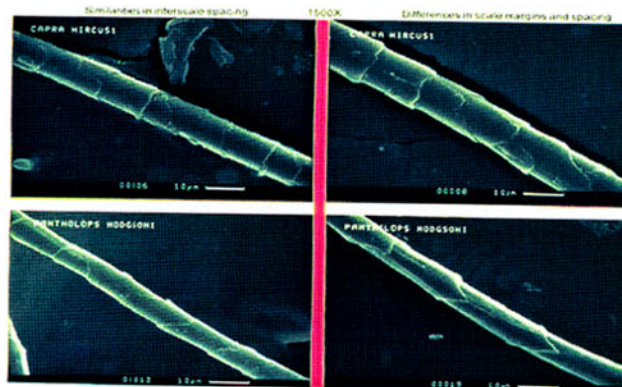
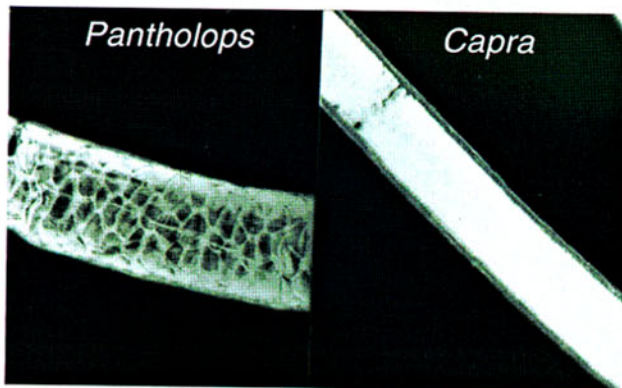
Methods



Both macroscopic and microscopic examinations were conducted. For the visual or macroscopic examination, four parameters were used: the weight of the shawl, the gross appearance of the kemp fibers, and the distinctive diamond pattern incorporated into the weave of an authentic shahtoosh shawl (above). The unknown fibers were compared directly to standards of cashmere goat, wild ibex, domestic sheep, muskoxen, and the Tibetan antelope.

Kemp fibers are the coarse fibers comparable to guard hairs, that inevitably get incorporated into a fine shawl. The kemp fibers from the Tibetan antelope (b) are crinkled and brittle in comparison to the kemp fibers from a Mongolian cashmere goat (a). Microscopic differences were found to be significant as well.

Results



The medulla of the kemp fibers of *Pantholops* provide the most distinctive species identification feature. The continuous lattice medulla that completely fills the diameter of the shaft and the rounded shape of the large medullary cells are characteristics of *Pantholops*. Kemp fibers are readily found incorporated into the weave of shahtoosh shawls and may be identified under transmitted light microscopy.

The woolly fibers of many wild and domesticated ungulates can be less than 10 microns in diameter, depending on age, breed, and position on the fiber shaft. Scale patterns are simple coronal shapes and vary along the shaft. Even though distinctions in the scales of *Pantholops* can be seen using scanning electron microscopy, these subtleties are subject to sampling and observer biases.

Conclusions

The fine woolly fibers of cashmere goats were not reliably differentiated from the fine fibers of the endangered Tibetan antelope by SEM. Nevertheless, kemp fibers are readily found incorporated into the weave of shahtoosh shawls and may be identified under transmitted light microscopy by the configuration of the medulla.